AMENDMENTS TO THE CLAIMS

1. (Previously Presented) A method for forming a predictor set of features associated with a target, comprising:

(a) selecting a predictor set of features;

(b) adding at least one complement to said predictor set based on a quality of prediction;

(c) checking to see if all of said features are repeated; and

(d) removing at least one feature from said predictor set; and

as a result of performing each of steps (a)-(d) at least once, forming a predictor set for predicting the presence of said target.

2. (Previously Presented) A method as recited in claim l, further comprising repeating steps (d), (b) and then (c) until determined in step (c) that all of said features of said predictor set have been repeated *k* times in a row, wherein *k* corresponds to the number of features in the predictor set.

3. (Previously Presented) A method as recited in claim 1, wherein said complement is a feature that when added to the features of said predictor set forms a predictor set having a quality of prediction for predicting said target that satisfies a predetermined threshold level.

4 - 6. (Canceled)

7. (Previously Presented) A method as recited in claim 2, wherein said k features of the predictor set are ordered; and wherein said feature that is removed from said predictor set is the first feature in the ordered predictor set.

8. (Canceled)

9. (Previously Presented) A method as recited in claim 1, wherein said selecting step comprises:

selecting *k*-1 number of features at random, wherein *k* is a number greater than 1.

10. (Original) A method as recited in claim 1, wherein said features of said predictor set are selected in a defined order.

11. (Previously Presented) A method as recited in claim 10, wherein said feature that is removed from said predictor set in step (d) is the earliest feature defined in the ordered predictor set.

12. (Original) A method as recited in claim 1, wherein the predictor set and target are vectors in M-dimensional space.

13. (Original) A method as recited in claim l, wherein said selected predictor set has a size of between 1-1000 features.

14. (Previously Presented) A method as recited in claim 1, wherein said steps of selecting and adding are performed by a processor-based device using a first algorithm, and wherein said checking step is performed by a separate algorithm.

15 - 34. (Canceled)

35. (Previously Presented) The method of claim 1 further comprising:

once determined by said checking step that all of said features of a predictor set have been repeated *k* consecutive number of times, then said forming step comprises forming a predictor set of the repeated *k* number of said features for predicting the presence of said target; and

using, for predicting the presence of said target, the formed predictor set of *k* features.

36. (Previously Presented) The method of claim 35 wherein said using said formed predictor set of *k* features comprises:

using said formed predictor set of *k* features to determine whether said target is present in a sample.

37. (Previously Presented) The method of claim 1 wherein said selecting step comprises selecting *k*-1 features associated with said target to include in said predictor set, wherein *k* is a number greater than 1.

38. (Previously Presented) The method of claim 37 wherein said adding step comprises adding a complement to said k-1 features to form a predictor set of k features.

39. (Previously Presented) The method of claim 38 wherein said checking step comprises checking to see if all of said k features of said predictor set have been repeated k times in a row.

40. (Previously Presented) The method of claim 39 wherein said removing step comprises:

if determined in step (c) that all of said k features of said predictor set have not been repeated k times in a row, removing at least one feature from said predictor set and returning to step (b).

41. (Previously Presented) The method of claim 40 further comprising:

(e) if determined in step (c) that all of said k features of said predictor set have been repeated k times in a row, then determining such predictor set as a best predictor set of k features for predicting the presence of said target.

42. (Previously Presented) The method of claim 41 further comprising:

ordering the k-1 subset of features in a list.

43. (Previously Presented) The method of claim 42 wherein said adding at least one complement to said subset comprises:

adding said at least one complement to one end of said list.

44. (Previously Presented) The method of claim 43 wherein said removing at least one feature from said predictor set comprises:

removing said at least one feature from the other end of said list.

45. (Previously Presented) The method of claim 41 further comprising:

determining whether the determined best predictor set of k features for predicting the presence of said target satisfies a predetermined threshold for quality of prediction.

46. (Previously Presented) The method of claim 45 wherein if determined that the best predictor set of k features for predicting the presence of said target does not satisfy said predetermined threshold, then incrementing the value of k.

47. (Previously Presented) The method of claim 46 further comprising:

repeating steps (a)-(e) for the incremented value of k.

48. (Previously Presented) The method of claim 45 if determined that the best predictor set of k features for predicting the presence of said target does not satisfy said predetermined threshold, performing the following:

(f) selecting the determined best predictor set of k features; and

(g) adding at least one complement feature to said k features to form a new predictor set of k+1 features.

49. (Previously Presented) The method of claim 48 further comprising:

(h) checking to see if all of said k+1 features of said new predictor set have been repeated k+1 times in a row;

(i) if determined in step (h) that all of said k+1 features of said new predictor set have not been repeated k+1 times in a row, removing at least one feature from said new predictor set and returning to step (g); and

(j) if determined in step (h) that all of said k+1 features of said new predictor set have been repeated k+1 times in a row, then determining such new predictor set as a best predictor set of k+1 features for predicting the presence of said target.

50. (Previously Presented) The method of claim 49 further comprising:

determining whether the determined best predictor set of k+1 features for predicting the presence of said target satisfies said predetermined threshold for quality of prediction.

51. (Previously Presented) The method of claim 41 comprising:

performing at least said adding, checking, removing, and determining steps with a processor-based device.

52. (Previously Presented) The method of claim 1 wherein each of said features comprises corresponding measurement data.

53. (Previously Presented) A method comprising:

selecting k-1 subset of features associated with a target;

ordering the k-1 subset of features in a list;

adding to one end of the list a complement feature to form a predictor set of k features;

determining whether the features of the predictor set have appeared k consecutive times;

if the features of the predictor set have not appeared k consecutive times, then removing a feature from the other end of the list;

if the features of the predictor set have appeared k consecutive times, then determining that the predictor set is a best predictor set of k features for predicting the presence of said target; and

using the determined best predictor set of k features for predicting the presence of said target.

54. (Previously Presented) The method of claim 53 further comprising:

adding a second complement feature to the one end of the list.

55. (Previously Presented) The method of claim 53 further comprising:

repeating said adding, determining, and removing steps until said determining step determines a predictor set of features that have appeared k consecutive times.

56. (Previously Presented) The method of claim 53 wherein said selecting selects said k-1 subset of features at random.

57. (Previously Presented) The method of claim 53 wherein said using the determined best predictor set of k features for predicting the presence of said target comprises:

measuring the corresponding k features of said best predictor set of a sample to determine whether said target is present in said sample.

58. (Previously Presented) A method comprising:

(a) selecting k-1 subset of features associated with a target;

(b) ordering the k-1 subset of features in a list;

(c) adding to one end of the list a complement feature to form a first predictor set of k features;

(d) setting a counter for the number of consecutive times that the features of the first predictor set have appeared to 1;

(e) determining whether the counter equals k;

(f) if the counter equals k, then determining that the first predictor set is a best predictor set of k features for predicting said target;

(g) if the counter does not equal k, then removing a feature from the other end of the list of features that forms the first predictor set and adding to the one end of the list a second complement feature to form a second predictor set and proceed to step (h);

(h) if the subset of features of the second predictor set are the same as the subset of features of the first predictor set, then incrementing the counter and returning to step (e), otherwise set the counter to 1 and proceed to step (i);

(i) determining whether the counter equals k;

(j) if the counter equals k, then determining that the second predictor set is a best predictor set of k features for predicting said target;

(k) if the counter does not equal k, then removing a feature from the other end of the list of features that forms the second predictor set and adding to the one end of the list a third complement feature to form a new predictor set, and if the subset of features of the new predictor set are the same as the subset of features of the second predictor set, then incrementing the counter for the second predictor set and returning to step (i).

59. (Previously Presented) The method of claim 58 wherein k comprises any integer greater than 1.

60. (Currently Amended) A method comprising:

receiving a value k that is greater than 1;

from a number n of features associated with a target, wherein each feature comprises corresponding measurement data, selecting, at random, k-1 subset of said n features associated with said target;

ordering the k-1 subset of features;

adding to the ordered subset of features a complement feature to form a predictor set of k features, wherein said complement feature is one of said n features ~~that provides the highest quality set of k features for predicting presence of said target when added to the k-1 subset~~;

iteratively performing (i) determining whether the features of the predictor set have been encountered k consecutive times, and (ii) if the features of the predictor set have not been encountered k consecutive times, then removing a feature from the ordered subset and adding a complement feature to the ordered subset, wherein said complement feature is one of said n features ~~that provides the highest quality set of k features for predicting the presence of said target when added to the remaining k-1 subset of features in the predictor set~~;

once features of a predictor set have been encountered k consecutive times, then determining that such predictor set is a best predictor set of k features for predicting the presence of said target; and

determining if the determined best predictor set of k features achieves a threshold of quality of prediction of the presence of said target, wherein if said best predictor set of k features does achieve said threshold then the best predictor set of k features is determined as an optimal predictor set for predicting the presence of said target, and if said best predictor set of k features does not achieve said threshold then the value of k is incremented.

61. (Currently Amended) The method of claim 60 wherein said value of *k* is incremented to value *m*, wherein *m* is any value greater than *k*, further comprising:

from said number *n* of features associated with said target, selecting *k* subset of said *n* features associated with said target;

ordering the *k* subset of features;

adding to the ordered subset of features *m-k* complement features to form a new predictor set of *m* features, wherein said complement features are ones of said *n* features ~~that provide the highest quality set of *m* features for predicting the presence of said target when added to the *k* subset~~;

iteratively performing (i) determining whether the features of the new predictor set have been encountered *m* consecutive times, and (ii) if the features of the new predictor set have not been encountered *m* consecutive times, then removing a feature from the ordered subset and adding a complement feature to the ordered subset, wherein said complement feature is one of said *n* features ~~that provides the highest quality set of *m* features for predicting the presence of said target when added to the remaining *k* subset of features in the new predictor set~~;

once features of the new predictor set have been encountered *m* consecutive times, then determining that such new predictor set is a best predictor set of *m* features for predicting the presence of said target; and

determining if the determined best predictor set of *m* features achieves said threshold of quality of prediction of the presence of said target, wherein if said best predictor set of *m* features does achieve said threshold then the best predictor set of *m* features is determined as an optimal predictor set for predicting the presence of said target, and if said best predictor set of *m* features does not achieve said threshold then the value of *m* is incremented.

62. (Previously Presented) The method of claim 61 wherein said step of selecting *k* subset of said *n* features associated with said target comprises:

selecting said determined best predictor set of *k* features as said *k* subset.

63. (Previously Presented) A method comprising:

receiving, at a processor-based device having at least one processor, information about k-1 features associated with a target, wherein k is an integer greater than 1;

the processor-based device ordering the k-1 features in a list;

the processor-based device adding to one end of the list a complement feature to form a predictor set of k features, wherein said complement feature is selected by the processor-based device based on a quality of prediction of target;

the processor-based device iteratively performing (i) determining whether the features appearing on the list have repeatedly appeared on the list k consecutive iterations, and (ii) if the features have not appeared on the list k consecutive iterations, then removing a feature from the other end of the list and adding a new complement feature to the one end of the list, wherein said new complement feature is selected based on a quality of prediction of said target; and

once determined that features appearing on the list have repeatedly appeared on the list k consecutive times iterations, then the processor-based device determining that such list of features are a best predictor set of k features for predicting said target.

64. (Previously Presented) The method of claim 63 wherein said received information about said k-1 features comprises measurement data for each of said k-1 features.

65. (Previously Presented) A method comprising the steps of:

(a) selecting a subset of k-1 features associated with a target;

(b) adding at least one complement feature to said subset to form a predictor set of k features;

(c) checking to see if all of said features of said predictor set have been repeated k times in a row;

(d) if determined in step (c) that all of said features of said predictor set have not been repeated k times in a row, removing at least one feature from said predictor set and returning to step (b); and

(e) if determined in step (c) that all of said features of said predictor set have been repeated k times in a row, then determining such predictor set as a best predictor set of k features for predicting said target.

66. (Previously Presented) The method of claim 65 further comprising:

using the determined best predictor set of *k* features for predicting the presence of said target.

67. (Previously Presented) The method of claim 66 wherein said using said determined best predictor set of *k* features for predicting the presence of said target comprises:

using said best predictor set of *k* features to determine whether said target is present in a sample.

68. (Currently Amended) The method of claim 65 wherein said target comprises one selected from the group consisting of:

protein, gene, ~~immunological information,~~ and disease.

69. (Previously Presented) The method of claim 65 comprising:

performing at least said adding, checking, removing, and determining steps with a processor-based device.

70. (Previously Presented) The method of claim 65 wherein *k* comprises a number greater than 1.

71. (Previously Presented) The method of claim 41 wherein said forming comprises:

forming said predictor set as said determined best predictor set for predicting the presence of said target.

72. (Previously Presented) The method of claim 58 wherein said complement feature is a feature that when added to the *k*-1 subset forms a set of *k* features that satisfies a defined quality threshold for predicting the presence of said target.